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PREFACE

Based in Ankara in Turkey, the independent academic publisher, Akademisyen Publishing House, has been publishing books for almost 30 years. As the directors of Akademisyen Publishing House, we are proud to publish more than 3800 books across disciplines so far, especially in Health Sciences. We also publish books in Social Sciences, Educational Sciences, Physical Sciences, and also books on cultural and artistic topics.

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We thank all of the authors with whom we collaborated to publish their books across disciplines.

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Chapter 1

THE REVIEW OF DIRAC OPERATORS IN MATHEMATICS: A BIBLIOMETRIC ANALYSIS

Özge AKÇAY[1]

INTRODUCTION

Bibliometric analysis is a methodological approach developed for the quantitative analysis and interpretation of scientific studies. It primarily involves measuring, modeling, and visualizing bibliographic relationships (citations, co-citations, co-authorships, bibliographic duplications, etc.) based on publication (articles, books, conference proceedings, etc.), citation, and keyword data. This interdisciplinary field is intertwined with the literatures of information science, library and information studies, and research evaluation.

We can give the main objectives of bibliometric studies as follows: evaluation of scientific production at the author, institution, country and journal levels, measuring scientific activity and impact areas, citation counts and impact indexes, mapping a research area, revealing collaboration patterns (e.g. between authors, institutions, countries) and information flows through network analysis, literature review and key researcher identification. Recently, bibliometric analysis has been put forward for many scientific studies in different disciplines. The following studies can be given as examples: (Akçay, 2025a, 2025b; Akçay and Can, 2025; Ay et al., 2024; Bekler et al., 2024; Burkut & Dal, 2023; Tuğrul, 2025; Tuğrul & Can, 2025; Tekin, Ay & Dal, 2025).

In this work, bibliometric analysis of Dirac equations, which are equations of quantum mechanics and have an important place in both physics and mathematics, was made, especially in the field of mathematics. Before performing bibliometric analysis, it is necessary to give information about Dirac operators in the mathematics. In particle physics, the Dirac equation is a relativistic wave equation derived by British physicist Paul Dirac in 1928 (Dirac, 1928).

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shape research trends in the field. Furthermore, bibliographical coupling analyses across documents, sources, authors, and countries demonstrate a strong global collaborative network for research on Dirac operators. Journals such as "Journal of Geometry and Physics", "Advances in Applied Clifford Algebras", and "Journal of Functional Analysis" are identified as central publication platforms in the field, while researchers such as "F. Sommen", "D. Eelbode" and "H. De Schepper" are among the most productive authors. Country-based analyses reveal that the "USA", "Germany" and "China" are the countries with the highest publication production.

Overall, it can be concluded that research on Dirac operators has progressed both quantitatively and qualitatively, evolving in strong relationships with fields such as spectral theory, differential geometry, and quantum mechanics. The bibliometric analysis presented in this study provides an important framework for future scientific research by revealing the structure of the existing literature, its development trends, prominent research areas, and collaboration networks. In this respect, this work contributes to a more systematic and strategic development of the literature on Dirac operators in the mathematical context.

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Bölüm 2

CONVERSATIONAL MARKETING WITH AI-POWERED CHATBOTS: A COMPREHENSIVE BIBLIOMETRIC ANALYSIS

İbrahim Halil EFENDİOĞLU[1]

INTRODUCTION

A chatbot is an artificial intelligence software that can conduct natural language conversation via voice or text. Businesses use conversational marketing, a strategy that involves engaging customers in personalized, one-on-one conversations, to save time, personnel, and financial expenses, while also enhancing customer experiences. The global chatbot market, which reached $137 million in 2023, is expected to grow to $455 million by the end of 2027. As the fastest-growing communication channel for brands, chatbots can reduce routine response times by up to 80%, helping businesses save approximately 30% on customer support costs. These practical benefits underscore the potential of conversational marketing in the business world, providing a reliable and efficient solution for customer engagement. Furthermore, in 2023, around 67% of consumers used a chatbot, indicating a growing preference for this technology (Connell, 2024). Approximately 71% of consumers favor real-time and swift communication with businesses. 52% of consumers state that if a company provides support with chatbots, they are more likely to shop from that business again. On the other hand, businesses can save up to 30% on the cost spent on customer support thanks to chatbots. Additionally, 79% of companies report that the conversational marketing bot yields positive results in terms of customer loyalty, sales, and revenue (Sendpulse, 2024). Therefore, conversational marketing, with its focus on one-on-one conversations with customers throughout their purchasing

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psychological effects of AI-powered chatbots in marketing could provide valuable insights into consumer satisfaction and loyalty.

Lastly, the study could benefit from a deeper exploration of the effects of emerging technologies and AI trends. There is a growing need for more research on how technologies like natural language processing (NLP) and affective AI influence marketing strategies and how these technologies can be implemented. Additionally, the study could delve into the increasingly crucial topics of data privacy and ethical concerns in consumer-business interactions.

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Bölüm 3

GLOBAL RESEARCH TRENDS IN MARBLE DETERIORATION: A WEB OF SCIENCE-BASED BIBLIOMETRIC ANALYSIS

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INTRODUCTION

Natural stones, especially marble, have been one of the primary building materials for architectural structures, sculptures, and cultural heritage elements for thousands of years due to their aesthetic appearance, high polishability, and homogeneous mineralogical structure. However, marble is exposed to physical, chemical, and biological degradation processes operating at different scales throughout its service life, and as a result of these processes, both its surface properties and mechanical strength change significantly over time. The multidimensional nature of marble degradation is frequently emphasized in the literature; it is stated that parameters such as temperature changes, moisture cycles, and mineralogical preferred orientation are decisive for the physical behavior of marble. For example, the highly anisotropic thermal expansion properties of calcite lead to stress accumulation at grain boundaries and microcrack formation, reducing the long-term strength of the material. This situation reveals that thermal effects and microcrack development are critical degradation mechanisms in the use of marble in both historical structures and modern architecture (Siegesmund, Ullemeyer, Weiss and Tschegg, 2000).

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Chapter 4

METAVERSE MARKETING AND CONSUMER DYNAMICS: A NEW ERA OF VIRTUAL INTERACTION

İbrahim Halil EFENDİOĞLU[1]

INTRODUCTION

The rapid convergence of physical and digital realities has given rise to the metaverse, a three-dimensional, immersive virtual space where individuals engage and interact through avatars using extended reality (XR) technologies such as virtual reality (VR) and augmented reality (AR) (Mystakidis, 2022). Within this context, the metaverse is increasingly recognized as a socio-technological ecosystem that transforms how users communicate, consume, and experience brands. This transformation has opened new frontiers for marketers, enabling the creation of interactive and immersive brand experiences that blend physical and virtual touchpoints (Dwivedi et al., 2023). As a result, metaverse marketing has emerged as a critical domain where companies experiment with novel ways to engage consumers through digital embodiment, gamification, and virtual co-creation.

Despite its growing commercial and academic relevance, the field of metaverse marketing remains in its formative stage. The research output on this topic has expanded rapidly in recent years, reflecting growing scholarly interest in understanding how consumers behave, interact, and form attachments in virtual spaces (Gao, Chong, & Bao, 2024). However, given the multidimensional and interdisciplinary nature of the metaverse, spanning marketing, technology, psychology, and human-computer interaction, there is a pressing need to map and synthesize the existing body of research systematically. Bibliometric analysis serves this purpose effectively by quantifying publication trends, identifying

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Strategy and economics. Model ROI of metaverse initiatives (cost of content, creator economies, pricing, tokenomics), multi-sided platform dynamics, and interoperability strategies; examine complements/substitutes with social media, mobile, and GenAI-enhanced channels.

Governance, ethics, and risk. Advance frameworks for privacy, safety, IP/consumer protection, dark-pattern mitigation, and accessibility; study bias in AI agents/avatars, identity portability, and community moderation at scale; quantify environmental impacts of computing/ledger choices.

Creator and community ecosystems. Investigate co-creation, user-generated assets, and social influence (parasocial ties with avatars, social proof in virtual venues); map roles of influencers, guilds, and DAOs in brand meaning and value capture.

Open science and reproducibility. Release cleaned bibliographic/keyword networks and synthetic XR datasets; encourage replication across platforms (e.g., Roblox, Fortnite, Horizon, Spatial) and verticals (retail, tourism, health, education).

Methodological transparency. Report clustering parameters, disambiguation rules, and inclusion criteria; triangulate bibliometrics with qualitative synthesis (scoping/systematic reviews) to enrich theory building.

Pursuing these directions will move the field from rapid descriptive growth to cumulative, theory-driven knowledge about how immersive technologies reshape consumer psychology, brand strategy, and market design while ensuring ethical, inclusive, and durable value creation in the metaverse.

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Chapter 5

ANALYSIS OF ALGORITHMIC TRADING IN A BIBLIOMETRIC CONTEXT: A COMPREHENSIVE REVIEW OF THE 2000-2025 PERIOD

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INTRODUCTION

The concept of trade has been at the heart of every structure involving humans throughout history, including individuals, societies, cities, nations, and states. Trade has guided the development of humanity and civilization, shaping our world from the past to the present by leading to the formation of societies, the establishment of states, wars, the development of languages, geographical discoveries, and the production of new technologies. The Sumerian civilization, one of the oldest known civilizations with a polytheistic belief system, considered its chief god, Enlil, to be the god of trade (Smith, 2008). Similarly, they attributed similar roles to gods named Hermes in Greek mythology and Veles in Slavic mythology. This shows that trade has been vital to societies since civilization began, and more examples can be added. Evolving from the instinct for survival to the accumulation of wealth and the goal of enrichment, trade has appeared in various forms and functions throughout history. Trade was first carried out through a barter system (Oliver & Mpinganjira, 2011). Barter is a system of exchange that allows goods and services to be traded directly for other goods and services without using a medium of exchange like money (O'Sullivan & Sheffrin, 2007). In the barter system, exchange occurred not only with useful products like metals and grains but also between ceremonial, symbolic, or prestige items. Whatever is exchanged through the barter system, the exchanged items must have a function, social benefit, and reciprocity (Smith, 2008). The needs of communities and tribes, arising from natural resources in their habitats, prompted inter-tribal interaction and exchange as demand grew for resources not available in those habitats.

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The increasingly sophisticated, data-intensive, and multi-dimensional nature of this thematic structure over time can be read as a modern reflection of the institutional, technological, and epistemological transformation that trade has undergone throughout history..

In conclusion, the long historical evolution of trade from barter-based social practices to digital markets governed by algorithmic models is directly related to the current scientific dynamics of the algorithmic trading literature. This study elucidates the components of the literature and its historical context through bibliometric analysis, yielding significant insights into the future of algorithmic trading. The findings indicate that the field will deepen further in subtopics such as reinforcement learning, behavioral-data hybrid models, high-frequency data analytics, and the crypto asset ecosystem in the coming period, strengthening its decisive role in financial decision-making processes. The point where these two axes converge is where trade ceases to be a form of social interaction and becomes a completely data-driven optimization problem. This situation represents the most advanced stage in the transformation of trade throughout history. This study comprehensively reveals the historical and scientific shaping of the field of algorithmic trading. The long journey of trade, from barter to today's automated decision-making systems, has produced new tools and forms of relationships in every era. However, today, it has evolved into an ecosystem that effectively utilizes financial models, data algorithms, and machine learning. In the future of algorithmic trading literature, more data sources, more complex learning algorithms, and the emergence of hybrid approaches at the intersection of behavioral finance and artificial intelligence are expected.

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Chapter 6

NEURO-ARCHITECTURE: DESIGN PRINCIPLES AND SCIENTIFIC VISUALIZATION

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INTRODUCTION

Neuroarchitecture is an architectural principle that combines neuroscience and architecture. Neuroarchitecture examines the physical and psychological responses of users to space and the environment (Eberhard, 2009; Ritchie, 2020). Neuroarchitecture aims to produce spatial designs in response to these responses and to enhance individual psychological processes. Space design and environmental factors significantly influence human perception, mood, and behavior. Individuals interact with their environment, exhibiting responses based on sensory, physical, and past experiences. A person's past memories and traumas influence their perception of space. This research examines neuro-architecture conceptually and theoretically. The study utilizes the scientific mapping method, a quantitative research method. This method reveals the conceptual, theoretical, and evolutionary development of the relevant literature through numerical data and frequencies. The findings of the research facilitate the emergence of influential publications on neuro-architecture in the current literature.

Moreover, concepts such as neuro-architecture, memory, architecture, built environment, direction, spatial orientation, sensation, interior space, neuro-aesthetics (Pearce et al., 2016; Vittorio, 2009), neuroscience (Eberhard, 2009;

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Chapter 7

A BIBLIOMETRIC STUDY ON ARTIFICIAL INTELLIGENCE APPLICATIONS IN BANKING

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INTRODUCTION

Industry 4.0 is an advancement in industrialization where service and production processes are optimized by using digital technologies, relatively reducing manual labor. Artificial intelligence (AI), a key element of this development, was introduced to the literature by John McCarthy at a conference in 1956. The concept of artificial intelligence refers to machines that possess human-like thinking abilities. AI is defined as a system that can mimic humans in reasoning, learning, and decision-making through computer software. Its ability to solve complex problems that humans struggle with and process large datasets is particularly prominent. These capabilities have had a significant impact on expanding the application areas of Industry 4.0 (Bahoo et al., 2024; Akbaba & Gündoğdu, 2021).

AI applications have found their place in all sectors. The banking sector is at the forefront of these sectors. This is largely due to the banking sector's extensive use of data and the highly efficient use of AI in prediction, analysis, and automation. Thanks to AI, it has become possible to improve service quality, increase operational efficiency, and strengthen risk management capacity rapidly and on a large scale. Accordingly, service structures based on human resources, especially customer service representatives, have largely begun to be replaced by artificial intelligencebased digital solutions such as chatbots, online platforms, and automated service systems. In this way, customer experience is improved; operational processes are accelerated; and risk management capacity is increased. With all these developments, the use of AI in the banking sector increases corporate performance and competitiveness. This also increases the ability of institutions to become a more strategic element (Sarı, 2021).

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organized models as we approach the present day.

Country and journal analyses were conducted to analyze studies from every region of the world. These analyses show an increase in internationally interactive publications in countries with high publication frequency. Considering the number of publications, China, the USA, and European countries rank highest. The factors determining the rankings are the number of publications and the impact values created by these publications through citations. Countries with high publication frequency have also seen a parallel increase in international publication relations. This demonstrates that AI in banking has both an interdisciplinary and intradisciplinary collaborative research atmosphere.

The study revealed that the research examined both the technical data and the quantitative data of AI as predictive analysis. These studies also demonstrate that they examine dimensions such as ethical implications, digital transformation, and transparency. Based on these findings, the study analyzes past approaches to AI in banking research and examines its evolutionary development to the present day. In this context, it provides a resource that will guide future research.

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Chapter 8

A BIBLIOMETRIC ANALYSIS OF HEALTH TOURISM LITERATURE: ECONOMIC IMPACTS AND POLICY IMPLICATIONS

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INTRODUCTION

Medical tourism is the practice of individuals traveling to tourist facilities outside their own countries to receive healthcare services, improve or maintain their health, and meet their accommodation, nutrition, and entertainment needs. This mobility encompasses both travel purposes and medical interventions. It also includes supportive health services such as well-being, spa treatments, stress reduction, and rehabilitation. In this context, it is clear that individuals consider not only doctors or prices in their own countries but also the best solutions and best price options when seeking solutions to their health problems. Therefore, all mobility arising from intercity or international travel for treatment and vacation purposes is called "medical tourism" (Aydın, 2012). At the same time, medical tourism is a sector that enables the growth of healthcare services by benefiting from international "health-related" mobility. Here, individuals travel abroad to access healthcare services. In a globalized world, increased cooperation between countries, greater freedom and opportunities for travel, improved transportation, and enhanced quality of healthcare services are making it possible to achieve improvements in different parts of the world (Tontus, 2019).

Thus, the concept of health tourism, which can be explained within the context of health economics, becomes clearer. Because from the perspective of health economics, health tourism is defined as a multi-dimensional economic activity that directly affects not only the healthcare sector but also the tourism, transportation, accommodation, and service sectors. In this context, health

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CONCLUSION

In conclusion, health tourism continues to be an important strategic area in terms of both economic and policy dimensions. Bibliometric analysis findings show that this field is being studied with increasing interest in the literature, and that research is concentrated around specific authors, countries, and sources. Examining the most cited studies reveals the economic contributions of health tourism, such as generating foreign exchange, supporting regional development, optimizing the capacity utilization of health systems, and encouraging infrastructure investments. In terms of policy recommendations, it emphasizes the need for developing national strategies, implementing financial incentives, ensuring the provision of services at international standards, and adopting sustainable tourism practices. This study goes beyond classical bibliometric analyses by thoroughly examining the most influential studies in the literature and offering concrete conclusions about the economic and policy impacts of health tourism. The findings provide a roadmap for academic research and shed light on strategic decision-making processes for policymakers and sectoral investors.

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